Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Service Rules for the 698-746, 747-762 And 777-792 MHz Bands	)	WT Docket No. 06-150
	)	
Former Nextel Communication, Inc. Upper 700 MHz Guard Band Licenses and Revisions to Part 27 of the FCC's Rules	)	WT Docket No. 06-169
	)	
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band	)	PS Docket No. 06-229
	)	
Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010	)	WT Docket No. 96-86

COMMENTS OF GOOGLE INC.

Google Inc. ("Google"), by its attorney, and pursuant to the Federal Communications Commission's Report and Order and Further Notice of Proposed Rulemaking,[1] files these comments in the above-referenced proceeding.

I. BACKGROUND AND SUMMARY

Google is a Web-enabled software applications and services company, based in Mountain View, California. Our self-defined mission statement is straightforward, if not daunting: to organize all of the world's information and to make it universally accessible and easy to use. In many ways, the organizing and usefulness components of that far-

[1] *In the Matter of Service Rules for the 698-746, 747-762, and 777-792 MHz Bands, et al*, WT Docket No. 06-150 *et al*, Report and Order and Further Notice of Proposed Rulemaking, FCC 07-72, released April 27, 2007 ("Further Notice").

reaching corporate goal are largely within the purview of the 13,000 men and women who work for Google, along with hundreds of thousands of small business partners, vendors, and of course our customers. The greater challenge is the central component: universal accessibility. Like other Internet-based companies, Google relies on the communications infrastructure provided by underlying carriers in order to reach our ultimate end users. In particular, in the United States, the telephone companies and cable companies control the only means of broadband access to Google's customers.

Google applauds the proposals put forth in this docket by the Coalition for 4G in America,[2] Frontline Wireless LLC,[3] and the Ad Hoc Public Interest Spectrum Coalition.[4] Taken together, key aspects of these plans – including large spectrum blocks, large service areas, combinatorial bidding, and a wholesale/open access "E" Block license -- will enhance the opportunity for new entrants to bid effectively and successfully in the upcoming 700 MHz auction. Google also points to its own recent proposal to clarify that 700 MHz licensees are authorized to utilize dynamic auction techniques, such as real-time auctions and per-device registration fees.[5] At the same time, adoption of these proposals is necessary, but not sufficient, to guarantee the deployment of the proverbial "third pipe" to the home. The Commission should take care not to put inordinate stock in the 700 MHz auction as the sole public policy response to our nation's concentrated and underperforming broadband market.

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[2] Comments of the Coalition for 4G in America, filed May 23, 2007 ("4G FNPRM Comments").

[3] Comments of Frontline Wireless, filed February 26, 2007 ("Frontline Comments").

[4] Comments of the Ad Hoc Public Interest Spectrum Coalition, filed April 5, 2007 ("AHPISC Comments").

[5] For a further discussion, see the attached ex parte letter submitted recently by Google in this proceeding. Letter from Richard S. Whitt, Washington Telecom and Media Counsel, Google Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket No. 06-150 et al., filed May 21, 2007 ("Google Ex Parte Letter").

II. GOOGLE SUPPORTS FEDERAL POLICIES THAT MAXIMIZE THE EFFICIENT AND INNOVATIVE USES OF RADIO SPECTRUM

While Google is a relative newcomer to the world of federal spectrum policy, the company's interest in the area is keen. In Google's view, government policies should maximize the efficient and innovative uses of radio spectrum; certainly those policies should not further exacerbate its historic scarcity. The electromagnetic waves that comprise our nation's airwaves are a precious natural resource, available potentially for myriad users and a vast number of uses. And yet, too often "command-and-control" spectrum policies have an unfortunate tendency to lock in incumbent users and uses, while locking out new entrants and innovative new uses of spectrum.

Optimally, the Federal Government should have in place a highly flexible, marketplace-driven spectrum regime, one responsive to economic signals and the public interest. Although the instant proceeding does not provide an opportunity to consider fundamental reforms of existing spectrum policies, the Commission at least should renew and strengthen its commitment to more incremental efforts. Within the confines of the current regime, a balanced blend of licensed and unlicensed uses seems most appropriate. The best current example on the unlicensed side is the ongoing TV "white spaces" proceeding.[6] As a member of the White Spaces Coalition, Google views the unused slices of spectrum between TV channels as key to the development of, among other things, innovative new applications utilizing non-interfering low-power devices.[7]

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[6] *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, First Report and Order and Further Notice of Proposed Rulemaking, 21 FCC Rcd. 12266 (2006) ("Further Notice").

[7] *See, e.g.*, Comments of Dell Inc., Google Inc., The Hewlett-Packard Company, Intel Corp., Microsoft Corp., and Philips Electronics North America Corp., ET Docket Nos. 04-186, 02-380, filed January 31, 2007; Reply Comments of Dell Inc., Google Inc., The Hewlett-Packard Company, Intel Corp., Microsoft Corp., and Philips Electronics North America Corp., ET Docket Nos. 04-186, 02-380, filed March 2, 2007.

Another potential avenue for the U.S. Government to begin unlocking the inherent value of the nation's airwaves include NTIA's current initiative "on needed reforms to domestic spectrum policies and management to enable the introduction of new spectrum-dependent technologies and services," including "policy reforms for expediting the American public's access to broadband services…."[8] Pending FCC proceedings, which address the development of newer concepts like spectrum sharing[9] and secondary markets,[10] also hold promise for expanding the usefulness of existing licensed spectrum.

III. WHILE THE UPCOMING AUCTION OFERS THE CONSIDERABLE PROMISE OF NEW BROADBAND PLATFORMS, IT IS NOT A NEAR-TERM PANACEA TO A CONCENTRATED BROADBAND MARKET

Google and others have amply documented over the past several years a significant lack of effective broadband competition in this country, and an equally compelling need for network neutrality safeguards.[11] After half a decade of Commission rulings which had the unfortunate effect of curtailing effective competition -- first from facilities-based carriers, and then from Internet service providers – few should be surprised that the network neutrality issue arose in such dramatic and impressive fashion.

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[8] "Commerce Spectrum Management Advisory Committee Meeting," Department of Commerce, National Telecommunications and Information Administration, 72 FR 27294 (May 15, 2007).

[9] *Federal Communications Commission Seeks Public Comment on Creation of a Spectrum Sharing Innovation Test-Bed*, ET Docket No. 06-89, Public Notice, FCC 06-77, released June 8, 2006.

[10] *In the Matter of Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, WT Docket No. 00-230, Third Report and Order, FCC 07-52, released April 11, 2007 ("Third Report").

[11] *See* Prepared Statement of Vinton Cerf, Vice President and Chief Internet Evangelist, Google Inc., U.S. Senate Committee on Commerce, Science, and Transportation, Hearing on Network Neutrality, February 7, 2007; *See* Prepared Statement of Vinton Cerf, Vice President and Chief Internet Evangelist, Google Inc., U.S. Senate Committee on the Judiciary, Hearing on Reconsidering Our Communications Laws, June 14, 2006; Comments of It's Our Net Coalition, WC Docket No. 06-74, filed on October 24, 2006.

Indeed, safeguards against discrimination by dominant broadband carriers can best be viewed as the only available proxy for real broadband competition. The challenge is to reduce the current need for explicit network neutrality safeguards, in part by finding concrete ways to expand the competitive broadband offerings available to consumers.

The 700 MHz auction will be the Commission's most important wireless-related action, perhaps for many years, because it eventually could lead to the introduction of one or more facilities-based providers of broadband services. Many even have touted the upcoming 700 MHz auction as the last great opportunity to fashion the long-awaited "third broadband pipe" to serve America's consumers. Google appreciates the good intentions at the root of this optimism, and urges the FCC to do everything in its power to maximize opportunities for new commercial entities to bid successfully in the auction.

At the same time, policymakers should not mistakenly overlook the considerable challenges that confront any prospective new entrant. Significant unanswered questions remain about whether -- let alone when and how – robust broadband competition will develop, or even if such competition is enough to discipline the market behavior of the incumbents. More to the point, there is no clear evidence that a wireless commercial platform based on available 700 MHz spectrum can compete effectively with entrenched broadband incumbents.

From a would-be new entrant's perspective, the considerable risks, delays, and expense should not be underestimated. First and foremost, any winning bidder in the auction eventually will be compelled to take on the high-capacity fiber networks of 2011 and beyond, not the lower-capacity copper and coax networks of 2007. Whether any single entity bidding in the upcoming auction can assemble the amount of spectrum

necessary to meet the bandwidth needs of a robust broadband platform is still unknown. In addition, a nationwide footprint is essential for any new entrant to attempt to become a national player, with customers in all areas of the country. Aside from the considerable investment required for the auction itself, a successful bidder must actually construct and operate physical networks. Those costs are especially high for new entrants lacking existing towers and rights of way, not to mention traffic backhaul facilities.

Thus, while this Commission should not hesitate to adopt certain key auction-related proposals, the agency must not then declare victory and simply walk away from a flawed broadband market. Favorable rules governing the 700 MHz auction and subsequent licenses will be absolutely necessary -- but far from sufficient -- to guarantee the arrival and eventual success of would-be broadband competitors.

IV. FAVORABLE AUCTION RULES AND SPECTRUM BAND PLANS WILL INCREASE THE CHANCES FOR NEW NATIONWIDE PLAYERS

As a gating factor, Google strongly supports holding the 700 MHz auction as soon as possible, and without undue delay. In addition, the Commission should allow interested entities as much time as possible – preferably six months between the adoption of final rules and the auction date – to conduct business plans and arrange for financing.

The Further Notice seeks comment on a number of requested band plans and auction rules now on the table.[12] Google urges the Commission to adopt our own service flexibility proposal, along with central components from proposals by the Coalition for 4G in America, Frontline Wireless, and the Ad Hoc Public Interest Spectrum Coalition.

[12] Further Notice at paras. 169-290.

A. The FCC Should Adopt Google's Proposal By Confirming That Licensees Would Be Authorized To Conduct Dynamic Auctions

As mentioned above, Google recently submitted an ex parte letter in this proceeding, seeking confirmation that successful bidders in the 700 MHz auction have the requisite authority to conduct dynamic auctions of their spectrum holdings. A copy of that letter is attached here, and is incorporated by reference.[13] Google welcomes the input of other commenting parties, and looks forward to a healthy public dialogue about tangible ways to enhance the value of commercial spectrum in the 700 MHz bands.

B. The FCC Should Adopt Its "Proposal 3," Along with Limited Combinatorial Bidding, A Two-Sided Auction, and Reasonable Build-Out Requirements

Google is a member of the Coalition for 4G in America, and supports the initial comments filed by the Coalition in this proceeding. In particular, the Commission should adopt Proposal 3 from the Further Notice,[14] and reconfigure the Upper 700 MHz band into one 11 MHz paired block (C Block) licensed in REAGs, and one 5 MHz paired block (D Block) licensed in MEAs.[15] Allowing a total of 22 MHz in a paired block will give greater flexibility to technologies with adjustable signal bands (such as WiMax), and additional capacity for technologies with fixed waveforms (such as EvDO).

The FCC's Wireless Telecommunications Bureau also should be permitted to adopt limited combinatorial bidding for certain packages in the Upper 700 MHz Band, including optimally a national package for each of the C and D blocks. Importantly, this

[13] See Attachment A (Google Ex Parte Letter).

[14] Further Notice at paras. 195-199.

[15] See 4G FNPRM Comments at 2-6.

proposal is based on the use of simple addition, without complicated algorithms, and still allows for numerous local and regional licenses in the Lower 700 MHz Band.[16] The Bureau also should be authorized to implement a two-sided auction of the D and A blocks, which could allow the creation of 6 MHz paired blocks.[17]

C. The Commission Should Adopt The Frontline Wireless Proposal

Google applauds the Commission for placing the Frontline Wireless proposal on public notice for comment,[18] and supports many elements in the proposal. In particular, the promise of creating a national public safety network, through the development of private-public partnerships via adjoining commercial and public safety spectrum, is very attractive. Given the immense expense and expertise necessary to build and operate a first-class wireless network, commercial and non-commercial entities should be given all the regulatory tools necessary to work together to help solve each other's problems.[19]

In addition, the wholesale/open access component of Frontline's proposal would ensure that at least some of the spectrum available in the auction would lead to an open broadband platform. While some have objected to the adoption of mandatory safeguards against packet discrimination, this aspect of the Frontline proposal would merely add an "E Block" license condition, which any entity can choose not to accept by not bidding for

[16] 4G FNPRM Comments at 6-14. Google also supports the 4G Coalition's proposal in the alternative for cross-block bidding packages under Proposals 4 and 5. *Id*. at 11.

[17] 4G FNPRM Comments at 15-16.

[18] Letter from Richard S. Whitt, Washington Telecom and Media Counsel, Google Inc., to Marlene H. Dortch, Secretary, FCC, WC Docket No. 06-150 *et al*., filed April 6, 2007.

[19] Moreover, while Frontline's plan is premised on a slightly different band plan than that proposed by the 4G Coalition, these differences can be reconciled without great difficulty.

that particular license. Thus, Frontline presents a unique market-based approach to fostering open networks.

D. The Commission Should Adopt Alternative Build-Out Requirements, New Entrant Bidding Credits, And Anonymous Bidding

There are several additional proposals that the Commission should adopt when fashioning its auction rules and band plans. First, the Further Notice asks for comments on several variations on performance, or "build-out," requirements.[20] Google certainly acknowledges the need to combat spectrum "warehousing," where entities lack economic incentives to complete building and operating their wireless networks. However, overly stringent deployment mandates will only harm the very entities that offer the greatest promise for independent broadband platforms.[21] Wireless incumbents generally have a far easier time incrementally adding network capacity than a new entrant without its own infrastructure or customers. One proposal would allow unlicensed devices to use those communications channels that have not yet been built out.[22] This approach appropriately balances the proper incentives for reasonable completion and operation of licensed networks, while at the same time freeing up unused spectrum for unlicensed use. Google asks that the Commission adopt this proposed approach.

The Commission also has suggested adopting a new entrant credit, which would be available only to entities not already holding spectrum licenses.[23] Given the daunting

[20] Further Notice at paras. 212-220.

[21] 4G FNPRM Comments at 14-15.

[22] AHPISC Comments at 10.

[23] Further Notice at para. 221.

challenges facing any would-be competitor, as discussed above, a new entrant credit makes eminent sense, and would be a more measured alternative to calls to prohibit or severely curtail auction participation by existing incumbents.

Finally, the Ad Hoc Public Interest Spectrum Coalition has recommended that the FCC adopt an anonymous bidding requirement.[24] Google agrees that the use of anonymous bidding appears to be a worthwhile complement to combinatorial bidding. In particular, anticompetitive signaling and blocking should be reduced by limiting information available to bidders to the current high bid and the bidding increment. This reduced level of information about bidders and bids is not uncommon in ordinary marketplace transactions.

V. CONCLUSION

For the foregoing reasons, the Commission should authorize Google's dynamic auction proposal, as well as adopt key aspects of proposals put forth by the Coalition for 4G in America, Frontline Wireless, and the Ad Hoc Public Interest Spectrum Coalition.

Respectfully submitted,

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May 23, 2007

[24] Further Notice at paras. 246-249.

ATTACHMENT A

EX PARTE LETTER SUBMITTED BY GOOGLE INC.

WT Docket Nos. 06-150 *et al.*

May 21, 2007

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May 21, 2007

Ex Parte via Electronic Filing

Marlene H. Dortch
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Re: Ex Parte Filing; Service Rules for the 690-746, 747-762, and 777-792 MHz Bands (WC Docket No. 06-150; WC Docket No. 06-129; PS Docket No. 06-229; WT Docket No. 96-86)

Dear Ms. Dortch:

Google Inc. ("Google"), by its attorney, respectfully submits this ex parte letter in the above-referenced dockets, and requests that it be made part of the public record for those proceedings. This letter details several important service rules proposals for which the Commission should seek immediate comment. In particular, the Commission should clarify that the service rules governing the 700 MHz bands already allow the use of dynamic auction techniques, such as real-time auctions and per-device registration fees.

Google is a Web-enabled software applications and services company, based in Mountain View, California. From the company's perspective, the upcoming 700 MHz auction presents a wholly unique opportunity for the Commission to adopt public polices that promote the efficient and innovative use of our nation's scarce spectrum resources to bring ubiquitous wireless broadband Internet access to all Americans. While the current record in this proceeding includes a number of different proposed spectrum band plans and service rules,[1] several of which merit the Commission's support, Google believes there are additional proposals that should be presented to the public for comment. These proposals will, among other things, enhance the opportunity for new entrants to bid effectively and successfully in the upcoming 700 MHz spectrum auction, and bring innovative new broadband-based applications, services, and devices to all Americans. Most importantly, by adopting these proposals, the Commission can help accelerate the

[1] *In the Matter of Service Rules for the 698-746, 747-762, and 777-792 MHz Bands, et al*, Federal Communications Commission, WT Docket No. 06-150 *et al*, Report and Order and Further Notice of Proposed Rulemaking, FCC 07-72, released April 27, 2007. Google plans to submit comments in this proceeding that will discuss the relative merits of those various proposals.

penetration and uptake of broadband services for consumers, and bridge the so-called "digital divide" that continues to separate far too many Americans from the technological tools critical to economic, social, and personal advancement.

The Vision: Formulating A More Flexible and Innovative Spectrum Policy

While Google is a relative newcomer to the world of federal spectrum policy, nonetheless the company's interest in this area is keen. In Google's view, government policies should maximize the efficient and innovative uses of radio spectrum, for the ultimate benefit of users. Certainly those policies should not further exacerbate its relative scarcity. Unfortunately, the U.S. Government's current "command-and-control" spectrum policies too often have a tendency to lock in incumbent users and uses, while shutting out new entrants and innovative new uses of spectrum, such as widely-available Internet access.

As has been pointed out by various studies, the vast majority of viable spectrum in this country simply goes unused, or else is grossly underutilized. Our nation typically uses only about five percent of one of our most precious resources, and even that minimal use is inefficient compared to what is technically possible today.[2] Unlike other natural resources, there is little benefit to allowing this spectrum to lie fallow. Furthermore, the airwaves can provide huge economic and social gains if used more efficiently, as seen today with the relatively tiny slices used by mobile phones and Wi-Fi services. Additionally, in some cases, while the legal rights to use the airwaves have been allocated and assigned, networks are not yet built out. This situation constitutes an entirely avoidable waste of valuable spectrum. For example, modern spectrum sensing technologies enabled by low-cost computers in communications devices can provide one obvious mechanism for restoring this resource to practical use. These technologies allow devices to use spectrum on a secondary basis without interfering or causing any harm to primary users or uses.[3]

Optimally the Federal Government should have in place a flexible, marketplace-driven spectrum regime, one responsive to economic signals and the public interest. Google's own experience amply demonstrates that reliance on market mechanisms, in concert with open communications platforms, brings maximum benefits to both providers and users. Thus, as a general forward-looking proposition, U.S. policy eventually should allow any spectrum that is unused at a particular place and time to be eligible for

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[2] In just one example, Shared Spectrum reported recently that actual spectrum utilization in any given geographic area averages some 5 percent of total available spectrum. See http://www.sharedspectrum.com/?section=nsf_measurements (last visited May 21, 2007).

[3] Google and other members of the White Spaces Coalition have presented such spectrum-sensing techniques to the FCC for unlicensed operations in the TV "white spaces" proceeding. *See, e.g.,* Comments of Dell Inc., Google Inc., The Hewlett-Packard Company, Intel Corp., Microsoft Corp., and Philips Electronics North America Corp., ET Docket Nos. 04-186, 02-380, filed January 31, 2007.

secondary uses by any lawful devices. This objective could be achieved, for example, through a dynamic auction mechanism, fixed per device registration fees (both of which will be described further), or on an unlicensed basis (as in the FCC's pending TV white spaces docket).

For purposes of this proceeding, as explained below, the Commission should clarify that the service rules governing the 700 MHz bands already allow the use of dynamic auction techniques, such as real-time auctions and per-device registration fees. By acknowledging the ability of licensees to harness the immense power of the marketplace, the Commission can facilitate the spread of ubiquitous two-way, high-speed, Internet-connected communications, and help close the digital divide.

The Commission Should Affirm The Ability To Use Dynamic Auction Mechanisms

As Eli Noam has observed,[4] there are intrinsic problems with the U.S. Government's current spectrum auction model. Among other things, auctions take money away from infrastructure build-outs, require advance payments that create unnecessary barriers to entry (especially for smaller firms and experimental technologies), and arguably constitute a tax by removing money from the private sector. Consumers obviously reap fewer benefits as well under this system.

In Google's view, many of these thorny problems could be alleviated by a more open and market-driven spectrum access policy. As one example, licensees could institute a dynamic auction mechanism, where a designated entity would provide access to spectrum on an as-needed basis. Payments would be made in perpetuity as the spectrum is being used, rather than months or even years in advance. Such a dynamic auction would facilitate infrastructure build-outs, remove barriers to entry for smaller and more innovative entities, and leave additional money in the private sector to build out infrastructure. From the consumer's perspective, these real-time wholesale platforms will help reduce retail prices, engender a host of new service offerings, and spread broadband Internet access to the farthest reaches of the country.

While dynamic auctions can take many forms, the central concept is to utilize intelligent devices to resolve spectrum access contention. Two examples are real-time airwaves auctions and device-driven registration processes.

Real-time airwaves auction model

- For each available spectrum band, the licensee could bestow the right to transmit an amount of power for a unit of time, with the total amount of power in any location being limited to a specified cap. This cap would be enforced by measurements made by the communications devices. For channel capacity

[4] "Taking the Next Step Beyond Spectrum Auctions: Open Spectrum Access," IEEE Communications, Vol. 33(12), December 1995.

efficiency reasons, bands should be allocated in as large chunks as possible. The airwaves auction would be managed via the Internet by a central clearinghouse.

Per-device registration fees

- As part of a real-time auction process, the communications device itself could become key to the payment process. For example, the consumer's price to purchase a device could include an airwaves registration fee (say, $5.00-10.00), which would grant the ability to gain unlimited use at a specified power level. The device could include collision-detection and back-off features (similar to Wi-Fi) to limit congestion.

Either or both of these dynamic auction mechanisms would provide more efficient utilization of spectrum, making it available for myriad users and uses. So, as one example, a consumer could purchase an IP-enabled "smart" communications handset at a retail store in Washington, D.C., and as part of that purchase pay a one-time $10.00 registration fee to access the pertinent spectrum. In turn, an ISP may have secured the rights to service that same device via the real-time auction of a licensee's spectrum holdings. Through the use of marketplace mechanisms, then, a particular slice of spectrum ends up in the hands of the user who values it most at any particular time and place.[5]

The existing rules governing the commercial bands of the 700 MHz spectrum appear already to allow licensees to employ these kinds of dynamic spectrum management techniques. Nonetheless, to eliminate any doubt, Google requests that the Commission declare that any successful bidder in the upcoming 700 MHz auction subsequently could institute such dynamic spectrum management practices. As shown above, employment of such an optimally priced system would bring very real benefits to providers and users alike. The Commission further should posit at least whether it would be in the public interest to mandate such treatment for some, or even all, of the commercial spectrum to be auctioned in the 700 MHz bands.

The Commission Should Require Broadband Platforms in the Lower 700 MHz Band

The current band plan for the Lower 700 MHz Band includes an unpaired 6 MHz "E" Block (722-728 MHz) that resides in current TV channel 56. This particular spectrum block appears to lack any significant immediate commercial value, due to the relatively limited bandwidth available and its unpaired nature. In order to unlock the long-term commercial potential of the E Block, and create the greatest possible efficient uses, the Commission should designate it as suitable, primarily or exclusively, for the deployment of broadband communications platforms. Specifically, the E Block only should be (1) utilized for interactive, two-way broadband services, (2) connected to the

[5] Additional background information on this proposal can be found in Appendix A to this letter.

public Internet, and (3) used to support innovative software-based applications, services, and devices.

Such a service requirement will help maximize the commercial utility of this particular spectrum band. Designation of the E Block in the Lower 700 MHz Band for interactive Internet-enabled services will create real opportunities for ubiquitous affordable wireless broadband Internet access, to the obvious benefit of consumers. This will help unlock the true long-term value of the spectrum, a goal which this Commission should embrace enthusiastically.

Should you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,

Richard S. Whitt, Esq.
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Google Inc.

APPENDIX A:
ADDITIONAL INFORMATION ON GOOGLE'S SPECTRUM PROPOSALS

The Economic Benefits of Real-Time Auctions

For every query using Google's search engine, the company separately performs its own real-time auction to determine the market price of a particular advertisement linked to a particular search term. In the same way, an auction could be performed for a radio transmission in a pertinent place and time to determine the economic value the market would support for that transmission.

In rural areas, auction-based prices typically would be much lower than in a large city because there would be fewer competing bids and less contention for use of the spectrum. Thus, a real-time auction would enable rural areas to have improved, low cost services. Because most cities have other options for moving information, such as fiber optics, spectrum would be utilized more efficiently simply by allowing the market to make the proper economic tradeoffs. In addition, a new service provider could enter a market immediately, with no significant capital outlay necessary, and would pay the same spectrum rates as others. Consumers would experience lower prices from the resulting competition.

The Interplay of Up-Front Auctions and Recurring Spectrum Payments

There is no conflict between a real-time auction and the current model of requiring an up-front auction payment for a block of spectrum. Under Google's proposal, a licensee can simply purchase spectrum initially in the up-front auction, and then recover its costs over time by charging third parties for real-time and place use. The chief difference is that in the real-time auction model, uses and users of the spectrum can change dynamically in response to ever-shifting market conditions.

Using the Internet and Spectrum Together for Greater Efficiency

Currently both wired and wireless communications are used in concert to move all types of information around the world. For example, a cell phone call is usually transmitted via radio to a base station, and then through fiber in an optical backhaul network, before finally being carried via radio to the receiving cell phone.

In order to efficiently manage and use spectrum, wherever possible wired communications infrastructure (in particular Internet access facilities) should be utilized instead of wireless spectrum to move information. Using today's technology, the amount of information that can be put through a single fiber optic cable is nearly unlimited in comparison to what can be sent via more constrained radiowaves. Therefore, if a wireless device is near a high-speed wired Internet connection, economics dictate that it would be preferable to connect the device directly to the Internet. Future spectrum policies should take this important fact into account, by providing the right incentives and policies to connect wireless devices to the Internet in ways that allow maximum usage by

the whole community. Connections between spectrum and Internet should be made widely available through reasonable market and/or open access means, using well understood protocols.

By providing efficient Internet-connected spectrum, the whole community gains far more information capacity than can be achieved through using spectrum alone. This increased availability of information will result in huge economic and social gains, as well as new innovative uses, as the quality, speed, and availability of both wired and wireless communications improve.

Favoring The Deployment of Two-Way Communications Infrastructure

Before the advent of personal computers and cell phones, most people primarily used spectrum to receive large-scale, unidirectional television and radio broadcasts. Because of this considerable history, most of our nation's best spectrum remains reserved for broadcasting uses. Nonetheless, as this Commission has recognized, interactive, two-way technologies such as wireless devices and, more recently, the Internet, are of increasing importance to the economic, social, and personal welfare of our citizens. Thus, as a general guiding principle, the Commission should render new spectrum allocations based on usage that supports primarily two-way communications.

The Critical Role of Resiliency

Our nation's communications infrastructure should be made resilient against all types of natural and man-made disasters. With proper design and ample bandwidth, wireless communications systems could provide incredibly important services at the time of a disaster. Adopting the principles discussed here will result in much more efficient use of our precious spectrum resources.